

REMARKS

This is a response to the non-final Office Action mailed on July 8, 2011. No fee is due in connection with this response. The Director is authorized to charge any fees that may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712161-88 on the account statement.

Claims 13-29, 31-33, 35-41, 44-49, 51-52 and 54 are pending in this application. Claims 1-12, 30, 34, 42-43, 50 and 53 were previously canceled. In the Office Action, Claims 13-29, 31-33, 35-37, 44-49, 51-52 and 54 are rejected under 35 U.S.C. §102; and Claims 38-41 are rejected under 35 U.S.C. §103. In response, the specification and Claims 13-14, 26-29, 49 and 51 have been amended, Claims 26-29 have been canceled without disclaimer, and Claim 55 has been added. The amendments do not add new matter. In view of the amendments and/or for the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn and the application now passed to allowance.

Applicants have amended the specification and Claims 14, 49 and 51 to correct informalities from the original translation. Applicants have also amended a paragraph in the specification based on currently amended Claim 13 and originally filed Claim 42 of US 2006/0148960 and added a new paragraph in the specification based on originally filed Claim 14 of US 2006/0148960. No new matter has been added by way of the amendments.

In the Office Action, Claims 13-29, 31-33, 35-37, 44-49, 51-52 and 54 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 6,033,514 to Davis et al. ("Davis") as evidence by U.S. Patent No. 2003/0049474 to Su et al. ("Su"). Applicants respectfully traverse the rejection for at least the reasons set forth below.

Independent Claim 13 has been amended to recite, in part, that P(i), or the sequences A of P(i), comprises a polyethylene and P(j) has a polydispersivity <30 and is a polyethylene wax. Independent Claim 13 has further been amended to recite, in part, that the polymer mixture of the first polymer P(i) and the second polymer P(j) has an elongation at break greater than an elongation at break of the first polymer P(i) alone. The amendments are supported in the specification, for example, at U.S. Patent Publication No. 2006/0148960, Figure 3 and paragraphs 41-42.

“One way for a patent applicant to rebut a prima facie case of obviousness is to make a showing of ‘unexpected results,’ i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). Applicants have surprisingly found that a polymer mixture consisting of at least one synthetic first polymer P(i) and between 3% to 14% by weight of at least one second polymer P(j) produced a compound having an increased elongation at break when mixed in a twin screw extruder as compared to the first synthetic polymer alone P(i). To support this discovery, Applicants previously submitted a Declaration under 37 C.F.R. §1.132 (the *Declaration* submitted with the supplemental response dated August 27, 2010) clarifying the individual data points for the amounts of P(j) up to 20% shown in Figure 3 of the pending application.

The claimed invention is directed to the necessary conditions relating to the structure sizes of P(i) and P(j) as well as the conditions for preparing suitable mixtures thereof so that these two polymers can crystallise jointly under heterocrystallisation. As a result of the very short chain length, very highly crystallisable P(j) induces crystallinity in P(i) and a network is formed whose linking points are heterocrystals of P(i) and P(j) and whose connecting elements consist of chain segments of P(i). Under suitable preparation conditions, a material can be obtained from the mixture of P(i) and P(j), which compared with P(i) alone has a higher breaking elongation.

Davis and *Su* alone or in combination fail to disclose or suggest each and every element of independent Claim 13. Specifically, *Davis* and *Su* alone or in combination fail to disclose or suggest a polymer mixture consisting of at least one synthetic first polymer P(i) comprising a polyethylene and between 3% to 14% by weight of at least one second polymer P(j) being a polyethylene wax as required by independent Claim 13. In addition, *Davis* and *Su* alone or in combination fail to disclose or suggest that the polymer mixture of the first polymer P(i) and the second polymer P(j) has an elongation at break greater than an elongation at break of the first polymer P(i) alone as required by independent Claim 13.

Davis is concerned with biaxially-oriented polypropylene films having improved barrier properties. These films comprise a core layer and cap layers on each side of the core layer. The core layer comprises polypropylene or a polypropylene copolymer, preferably having a low

content of comonomer ("less than three weight percent"; *Davis*, column 3, lines 1-15) and a wax in an amount of 0.25 to 15 weight percent (*Davis*, column 3, lines 49-59). Both components of the core layer (*Davis*, column 3, line 61) can be mixed using a twin screw extruder (*Davis*, column 4, lines 7-10). *Davis* fails to teach or suggest anywhere a synthetic first polymer P(i) comprising a polyethylene or a polyethylene sequence A having a degree of polymerization DPs of more than 20 comprised in the core layer.

Moreover, according to *Davis*, the wax is incompatible with the polypropylene or polypropylene copolymer of the core layer (*Davis*, column 2, lines 35-36; column 3, lines 20-29). "Incompatible" is defined that "the wax has only limited solubility with the polypropylene" (*Davis*, column 3, lines 21-22), "will concentrate in the amorphous regions of the resin [*polypropylene*]" and will "migrate throughout the polyolefin cap layers to the surface thereof" (*Davis*, column 3, lines 35-40; column 5, lines 47-49). As a result, *Davis* is distinguishable from the present claims because *Davis* teaches in essence that the first polymer and the second polymer of the present claims must be incompatible.

The linking points of the network of the present claims are crystallites formed between compatible parts/segments of the first and the second polymer. According to the present claims, for example, the following combinations of a first and a second polymer are possible: the first polymer is a polyethylene homopolymer and the second polymer is a polyethylene wax or the first polymer is a copolymer with the sequence A (having a degree of polymerisation of more than 20) being made up of ethylene units and the second polymer is a polyethylene wax. Only under these structural conditions (i.e., compatibility of the first and the second polymer) can a network formation by heterocrystallisation occur.

Su discloses an oil resistant multilayer film having a skin layer made of a blend of a crystalline wax and a non-polar polyolefin polymer. *Su*'s film can be used as packaging for oily food products, such as potato chips, wherein the film, in particular the skin layer, is able to act as an oil barrier so that a transfer of oil from the surface of the food product to the package's internal surface can be avoided. Taken the whole teaching of *Su*, the barrier function seems to be finally achieved by the crystalline wax that seems to migrate to the outside surface of the skin layer. See *Su*, paragraphs 22 and 29-30.

Even though *Su* generally mentions blends that are defined as “miscible” and “immiscible” (see *Su*, paragraphs 20 and 21), it should be acknowledged that the mobility of the crystalline wax in the surface layer seems to be THE important characteristic of *Su*’s blend. Accordingly, the formation of heterocrystallites, which inherently would prevent the desired mobility, is not disclosed or suggested by *Su*. In other words, comparable to the teaching of *Davis*, *Su* also seems to teach towards an incompatibility of a first and a second polymer and is thus also distinguishable from the present claims.

In sum, the cited references alone or in combination fail to disclose or suggest each and every element of independent Claim 13. Moreover, the cited references fail to even recognize the advantages, unexpected benefits and/or properties of a polymer mixture consisting of a molecularly dispersed mixture containing P(i) and P(j) having an elongation at break greater than an elongation at break of the first polymer P(i) alone. Consequently, independent Claim 13, along with any of the claims that depend from Claim 13, is novel and non-obvious over the cited references.

Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. §102 with respect to the pending claims be reconsidered and the rejection be withdrawn.

Claims 38-41 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Davis* and *Su* and in further view of the publication to *Kokko*. Applicants respectfully submit that the patentability of independent Claim 13 as previously discussed renders moot the obviousness rejection of Claims 38-41 that depends from Claim 13. In this regard, the cited art fails to teach or suggest the elements of Claims 38-41 in combination with the novel elements of Claim 13.

Applicants further note that Claim 55 has been newly added. The new claim is fully supported in the specification, for example, at U.S. Patent Publication No. 2006/0148960, Figure 3 and paragraphs 41-42 and Claim 13. Moreover, *Davis* fails to teach a polypropylene wax and further can not suggest such a polypropylene wax, which is compatible and not – as necessarily claimed by *Davis* – incompatible with the polypropylene or polypropylene copolymer. Applicants respectfully submit that Claim 55 should be allowed.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly solicit an early allowance of same. In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic

interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

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